

Hewlett-Packard and American Arium Deliver a Highly Integrated Debug Environment

Product Overview

To address the challenge of the accelerated time-to-market demands in today's complex computer market, Hewlett-Packard and American Arium (AA) have joined forces to offer a tightly integrated tools environment for debugging Pentium Pro and Pentium II processor based systems. AA's WinDb debugger combined with HP 16500, HP 16600, or HP 16700 logic analysis systems provides a powerful suite of integrated tools.

AA's powerful debugger environment for Intel IA-32 processors has now been linked to HP's logic analysis tools and emulation probes through a Windows 95/NT interface. This solution is based on the AA WinDb debugger for the Intel IA-32 architecture and the HP 16500, HP 16600, and HP 16700 logic analysis systems. The connection enables you to debug IA-32 based computers with unmatched visibility.

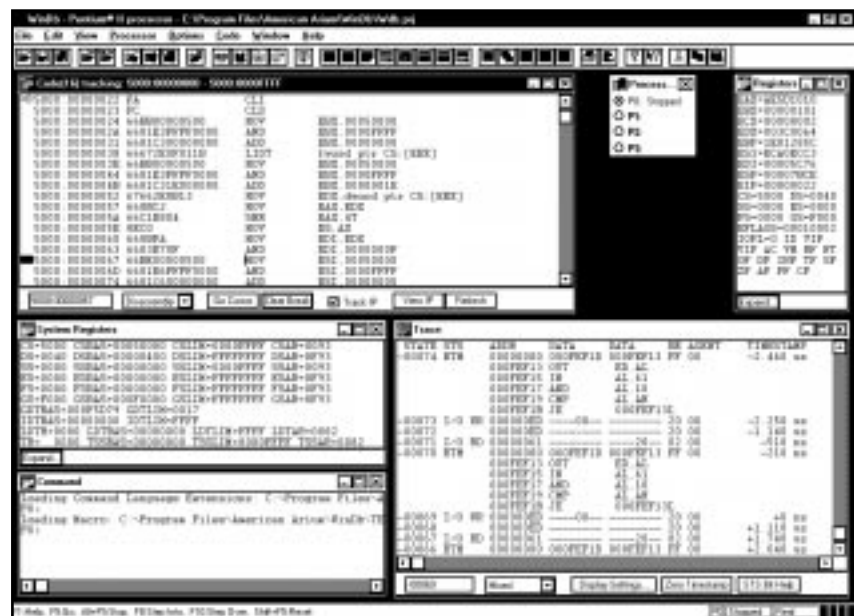


Figure 1: WinDb interfacing to HP 16700 hardware (assembly level debug)

Connection to HP Emulation and Analysis Probes

The WinDb debugger provides a single point of reference during the debug process, which reduces the time to isolate the root cause of HW/SW integration problems. It gives you the ability to set up breakpoints, view registers, memory, code, and disassembled real-time bus trace in one window. Disassembled code in the trace window is an accurate record of program execution with the proces-

sor's L1 and L2 caches enabled. The combined power of the WinDb debugger and HP deep memory real-time trace is shown in Figure 1. In this example, processor and bus breakpoints were set through the HP 16700 logic analysis system with the Pentium II processor emulation module and analysis probe. Upon the system encountering a breakpoint WinDb presents the real-time trace window by accessing trace data from the HP 16700 logic analysis system.



Figure 2: WinDb interfacing to HP 16700 hardware (C source debug)

As computer systems become more sophisticated, an increasing number of low-level programs are being written in C. The WinDb debugger includes tools to speed identification of problems when programs are developed in high level language. In figure 2 the code window displays source code in both C and assembly language. In addition, WinDb's Source code navigation window is shown. The navigation window gives you rapid access to source code, global, and local variables.

American Arrium WinDb Features

• All address modes supported

Wherever you stop the processor, addresses are translated in the current mode of the processor. Fly-over physical address translations help to correlate current context to physical addresses recorded in the logic analyzer.

• C source debug

More and more low-level code is being developed in C. Naturally, you want to debug in your native language. All data types are supported, so variables can be viewed and modified in their source level format.

• Step through code

You can single step through each line of assembly or C code to monitor registers and memory in detail.

• Source code navigator

With large C files and many linked modules, it can be tedious finding your way through all the code and symbols. The innovative navigator window allows quick, easy access to source, global, and local variables.

• Trace-to-source tracking

Trace is typically used to capture a code execution history. When inspecting trace, you can track the exact C source in the code window.

• Dynamic page translation

When paging is enabled, debugging can be time consuming. By using the dynamic page translator, you can easily relate physical addresses in the trace memory with linear or logical addresses. Without this feature, this procedure is normally very tedious.

• Debug up to 4 processors and multiple bus agents

With a symmetrical multiprocessing hardware design, the HP logic analyzer can capture up to four processors and multiple agents through one preprocessor. The bus agents captured in trace are color-coded in the trace window of WinDb.

• Robust command language

Many tasks can be automated by using the command languages of WinDb. For example, you can easily display all the registers of a chipset after stopping the processor.

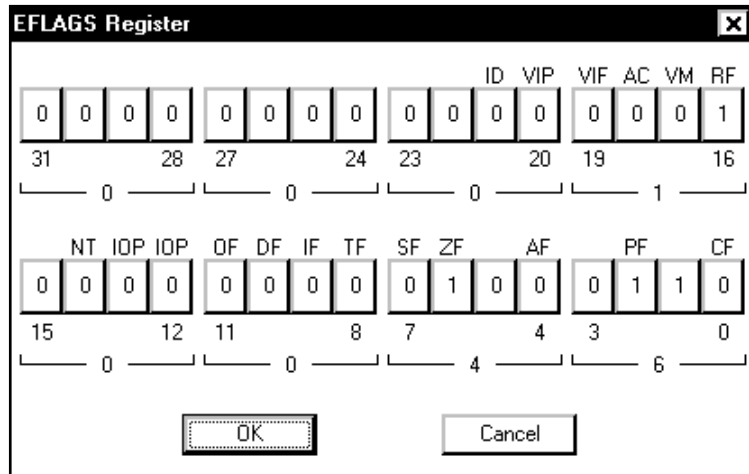


Figure 3: Example of binary register display

- **Trace disassembly with cache enabled**

For years logic analyzer users have been plagued by having to disable cache memory to view trace disassembly. By using Branch Trace Messages, you can view every executed instruction in trace without disabling the cache, thus debugging your real-time executed code.

- **Multiple level hardware break points**

Through WinDb you can take advantage of multiple level break points using the HP logic analyzer event recognizers.

- **Code download**

When software changes are made, you can save time by loading your code directly into the target memory.

- **Binary register expand function**

When exploring the state of the processor, it can be very helpful to view and change register contents in binary.

- **Window Save As functions**

Documenting bugs is important for a team project. Data displayed in WinDb, including the HP trace, can be saved to text files.



Figure 4: Example of descriptor window

- **Self-diagnostic test suite**

It is important to know that your test equipment is working properly. A full test suite to test run-control functions helps give you the confidence that the equipment is functioning properly.

- **Remote access**

The HP hardware can be accessed over a LAN or a WAN allowing you to debug from your office while the equipment is in the lab.

- **Functional descriptor window**

Protected-mode debugging can be a challenge. GDT, IDT, and LDT information can be easily accessed and modified through this interactive window.

HP 16XXX Based Pentium II Processor Emulation Solutions with Real Time Trace

HP's modular family of logic analysis provides the probing, memory depth, and speed to meet the needs of Pentium II processor based system debug. The HP 16500, HP 16600, and HP 16700 logic analysis systems can be configured with the performance and capabilities listed below.

- 2 MB memory depth: capture and analyze code flow and data flow
- up to 135 MHz state analysis: full speed bus trace of Pentium II processor based systems
- data time tagging: time-correlate analog, timing, and state events
- high signal integrity processor probing: Pentium Pro and Pentium II processor analysis probes
- analysis probes support for PCI, USB, ISA, SDRAM, and other processor buses: Monitor micro-processor activity in relation to system buses, other microprocessors, or I/O devices
- processor packaging support: use with Slot 1, Slot 2, and mobile compatible packages

HP B4600A/B System Performance Analysis Tool Set

The system performance analyzer (SPA) is an optional HP software package for the HP 16505A, HP 16600A and 16700A series logic analysis systems. The SPA tool set provides statistical performance measurements on your system such as state overview, state interval, time interval, and time overview. The same symbols used in the Pentium II analysis probe's transaction tracker are used to configure the SPA tool.

Warranty Information

These Hewlett-Packard products have a warranty against defects in material and workmanship for a period of one year from date of shipment. During this warranty period, Hewlett-Packard Company will, at its option, either repair or replace products that prove to be defective.

Product Listing

Hewlett-Packard:

Emulation and Real-time Trace

HP 16600 and 16700 series emulators and analysis systems

HP E5901A option 510 Pentium Pro and Pentium II emulation module

Either:

HP E2466B Pentium Pro processor analysis probe

HP E2466C Pentium II processor (≤ 300 MHz core) analysis probe

HP E2492S Pentium II processor (≥ 300 MHz core) analysis probe

HP E2494S Pentium II mobile processor and module analysis probe

HP 16500 logic analysis system:

HP 16500 logic analysis system with HP 16505A prototype analyzers require the HP E5900A option 510 emulation probe and one of the following processor specific analysis probe

HP E2466B Pentium Pro processor analysis probe

HP E2466C Pentium II processor (≤ 300 MHz core) analysis probe

HP E2492S Pentium II processor (≥ 300 MHz core) analysis probe

HP E2494S Pentium II mobile processor and module analysis probe

Processor Emulation Probe

HP E5900A option 510 Pentium Pro and Pentium II processor emulation probe.

Related Literature

Hewlett-Packard:

HP E2492S Preprocessor for the Intel Pentium II Processor with MMX Technology at 333 MHz	5966-0234E
--	------------

HP E2494S Preprocessor for the Intel Pentium II Mobile Module or Pentium II Mobile Processor	5966-2120E
--	------------

Emulation and Analysis Solutions for the Intel Pentium II processor with MMX Technology	5966-3880E
---	------------

American Arium:

WDB-HP Pentium Pro and Pentium II processor debugger used with the HP 16600 and 16700, E5901A option 500 emulation module or the HP 16500, E5900 option 510 emulation probe.

The above AA software is available for Windows 95, 98, and NT 4.0 operating systems.



American Arium
14281 Chambers Road
Tustin, CA 92780
Phone: (714) 731-1661
Fax: (714) 731-6344
URL <http://www.arium.com>
E-mail : info@arium.com

For more information on American Arium products and services, please contact American Arium.

For more information on Hewlett-Packard Test & Measurement products, applications or services please call your local Hewlett-Packard sales offices. A current listing is available via Web through Access HP at <http://www.hp.com>. If you do not have access to the internet, please contact one of the HP centers listed below and they will direct you to your nearest HP representative.



For more information about Hewlett-Packard test & measurement products, applications, services, and for a current sales office listing, visit our web site,
<http://www.hp.com/go/tmdir>

You can also contact one of the following centers and ask for a test and measurement sales representative.

United States:
Hewlett-Packard Company
Test and Measurement Call Center
P.O. Box 4026
Englewood, CO 80155-4026
1 800 452 4844

Canada:
Hewlett-Packard Canada Ltd.
5150 Spectrum Way
Mississauga, Ontario
L4W 5G1
(905) 206 4725

Europe:
Hewlett-Packard
European Marketing Centre
P.O. Box 999
1180 AZ Amstelveen
The Netherlands
(31 20) 547 9900

Japan:
Hewlett-Packard Japan Ltd.
Measurement Assistance Center
9-1, Takakura-Cho, Hachioji-Shi,
Tokyo 192, Japan
Tel: (81-426) 56 7832
Fax: (81-426) 56 7840

Latin America:
Hewlett-Packard
Latin American Region Headquarters
5200 Blue Lagoon Drive
9th Floor
Miami, Florida 33126
U.S.A.
Tel: (305) 267 4245/4220
Fax: (305) 267 4288

Australia/New Zealand:
Hewlett-Packard Australia Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130
Australia
1 800 629 485 (Australia)
0 800 738 378 (New Zealand)
Fax: (61 3) 9210 5489

Asia Pacific:
Hewlett-Packard Asia Pacific Ltd
17-21/F Shell Tower, Times Square,
1 Matheson Street, Causeway Bay,
Hong Kong
Tel: (852) 2599 7777
Fax: (852) 2506 9285

Technical information in this document is subject to change without notice

Printed in U.S.A. 08/98
5968-1661E